

**A closer look at *Asclepias engelmanniana* Woodson and *Asclepias rusbyi* (Vail) Woodson
(Apocynaceae, Asclepiadoideae)**

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ABSTRACT

A closer look is taken at the anther wings of *Asclepias engelmanniana* and *A. rusbyi* and important differences are described. It is postulated that they are better diagnostic characters than the rudimentary horns of both taxa, and that the two taxa should be retained as distinct species. Photos and diagrams are provided to illustrate the thesis. Published on-line www.phytologia.org *Phytologia* 96(4): 241-246 (Oct 1, 2014). ISSN 030319430

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Ever since Elliott (1817) published the genus *Acerates* (Greek for ‘without horns’), the presence or absence, and the size when present, of the coronal horn has been considered an important taxonomic character by authors working on Apocynaceae, subfamily Asclepiadoideae. Yet Elliott himself had doubts about its importance, and he was not alone in this regard. Greene (1897) deplored the “fanciful and exaggerated importance...given to that diminutive organ.” Yet the suggestion of the importance of the horns persists to this day, even though *Acerates* has long been considered a synonym of *Asclepias*. After Vail (1898) distinguished *Acerates rusbyi* Vail from *A. auriculata* Engelm. ex Torr. (1859), there has been contention over the suitability of such separation. Vail did not mention the horn in *A. auriculata*, but she noted that the anther wings were “incurved over the anthers at the summit.” With *A. rusbyi* she did cite the horn, but also noted that the anther wings were merely “salient and notched near the base.” However, she did not find these differences to be taxonomically significant. Later, Woodson (1941) incorporated *Acerates* Elliott into *Asclepias* L. and replaced *Acerates auriculata* with the new name, *Asclepias engelmanniana* Woodson, because of the prior publication (1819) of *Asclepias auriculata* Kunth. Kearney (1949) subsequently reduced *A. rusbyi* to a variety, *A. engelmanniana* var. *rusbyi* (Vail) Kearney, citing only its horn to distinguish it from var. *engelmanniana*. A few years later, Woodson (1954) raised it back up to species rank as *A. rusbyi* (Vail) Woodson, citing both the horn and the anther wings; finally Sundell (1990) upheld its varietal status, again citing only the horn. In the two cases arguing for varietal status, the rudimentary and highly-variable horn was given major taxonomic significance, all the while a much more reliable character mentioned by Vail and used by Woodson was given no notice at all, i.e. the anther wings or guide rails.

OBSERVATIONS & CONCLUSIONS

The anther wings of *A. engelmanniana* are unique among all species of *Asclepias* in that they arch in such a way as to position the corpuscula of the pollinaria directly on top of the stigma head, rather than along its sides as in all of the other species. Yet Sundell’s (1993) observation of this character was limited to “anther wings 2-2.4 mm long,” while he described the horn at length (50 words). By contrast the anther wings of *A. rusbyi* are more conventional, with only a slight curve, not an arch, and the corpuscula are positioned along the sides of the stigma head. In most species of *Asclepias*, access to the anther wings is at their base, which is often flared to permit the entrance of a leg or bristle of a pollinator moving upwards. In the case of the arched anther wings of *A. engelmanniana*, there may be a flare at the base of the wings, but, due to the arch, this would be of little value to its pollination. Consequently, there is also an additional flaring where the anther wings arch that allows easy access to the corpuscula by a lateral

rather than a vertical movement of the insect's leg. These arched anther wings are a diagnostic character for *A. engelmanniana*, and such are lacking in *A. rusbyi*. Are they important enough to distinguish two taxa? In my view they are and I would maintain *A. rusbyi* as a good species.

Because it is risky to base a species on a single character, no matter how important it may seem, there are yet other characters that can be used to separate the two. In *A. engelmanniana* the column is shorter than in *A. rusbyi* (Vail also noted this) and the gynostegium appears to sit directly upon the corolla. In *A. engelmanniana* the hoods are flattened and adpressed to the anthers, while in *A. rusbyi* the hoods are narrower and somewhat spreading, i.e. they are held farther from the anthers with a space between them. The nectar reservoirs are positioned lower and are deeper in *A. engelmanniana* than in *A. rusbyi*. Finally the horn is positioned lower in the hood in *A. engelmanniana* than it is in *A. rusbyi*. In the latter the horn is often visible. The pollinaria of both species are quite similar. I also note that, due to the similarity of these two species, hybrids should be expected where their ranges overlap. I have seen hybrids between *A. syriaca* L. and *A. speciosa* Torr. in central KS, and those two species are more distinct than the two discussed here. I have also reported on a hybrid between *A. syriaca* and *A. purpurascens* L. in central MO (Rintz 2014), and those two species are also quite distinct.

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LITERATURE CITED

- Elliott, S. 1817. Sketches of the Botany of South Carolina & Georgia. Pp. 316-317.
 Greene, E.L. 1897. On the Classification of Asclepiads. Pittonia 3: 231.
 Kearney, T.H. 1949. Miscellaneous New Combinations. Leaflets of Western Bot. 5: 197.
 Rintz, R.E. 2014. A Naturally-occurring Hybrid Between *A. syriaca* L. and *A. purpurascens* L. Phytologia: 96(2): 130-134.
 Sundell, E.G. 1990. Notes on Arizona *Asclepias* (Asclepiadaceae) with a New Combination. Phytologia 69(4): 268.
 Sundell, E.G. 1993. Asclepiadaceae. J. Arizona - Nevada Acad. Sci. 27(2): 175.
 Vail, A.M. 1898. Studies in the Asclepiadaceae—II, A Revision of the Genus *Acerates* in the United States. Bull. Torr. Bot. Club 25: 36-37.
 Woodson, R.E. 1941. The North American Asclepiadaceae. Ann. Missouri Bot. Gard. 28: 193-244.
 Woodson, R.E. 1954. The North American Species of *Asclepias*. Ann. Missouri Bot. Gard. 41: 1-211.



Figure 1. Two flowers compared: *Asclepias rusbyi* and *Asclepias engelmanniana*.



Figure 2. *Asclepias engelmanniana* flower from Cimarron Co., OK. Note the additional flaring of the anther wings along the arch, besides the flaring at the base.



Figure 3. *Asclepias rusbyi* flower from Navajo Co., AZ. Inset shows the pollinarium.

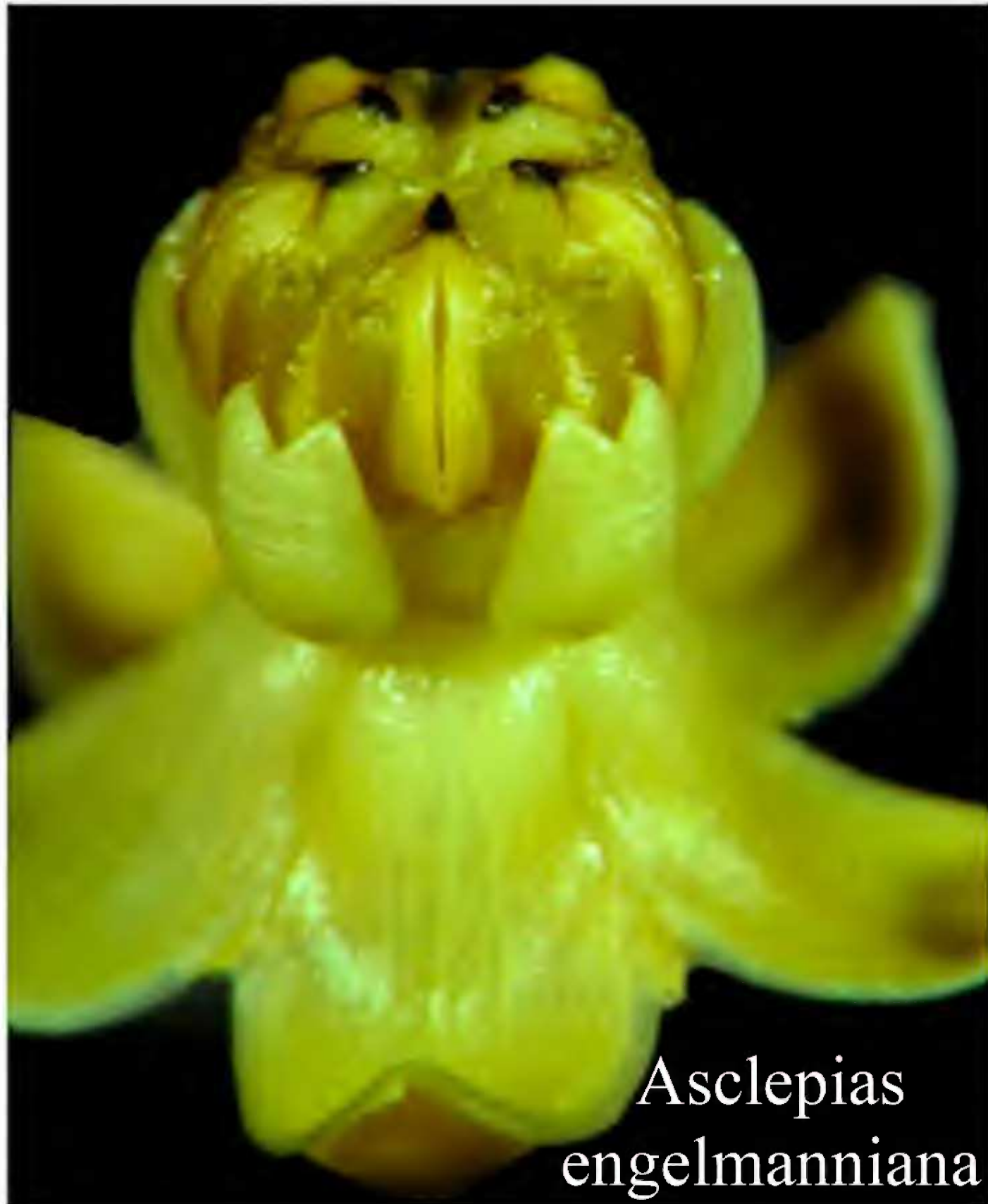


Figure 4. *Asclepias engelmanniana* flower from Armstrong Co., TX. Note the lack of flaring at the base of the anther wings and the deeper notch at the apex of each hood.

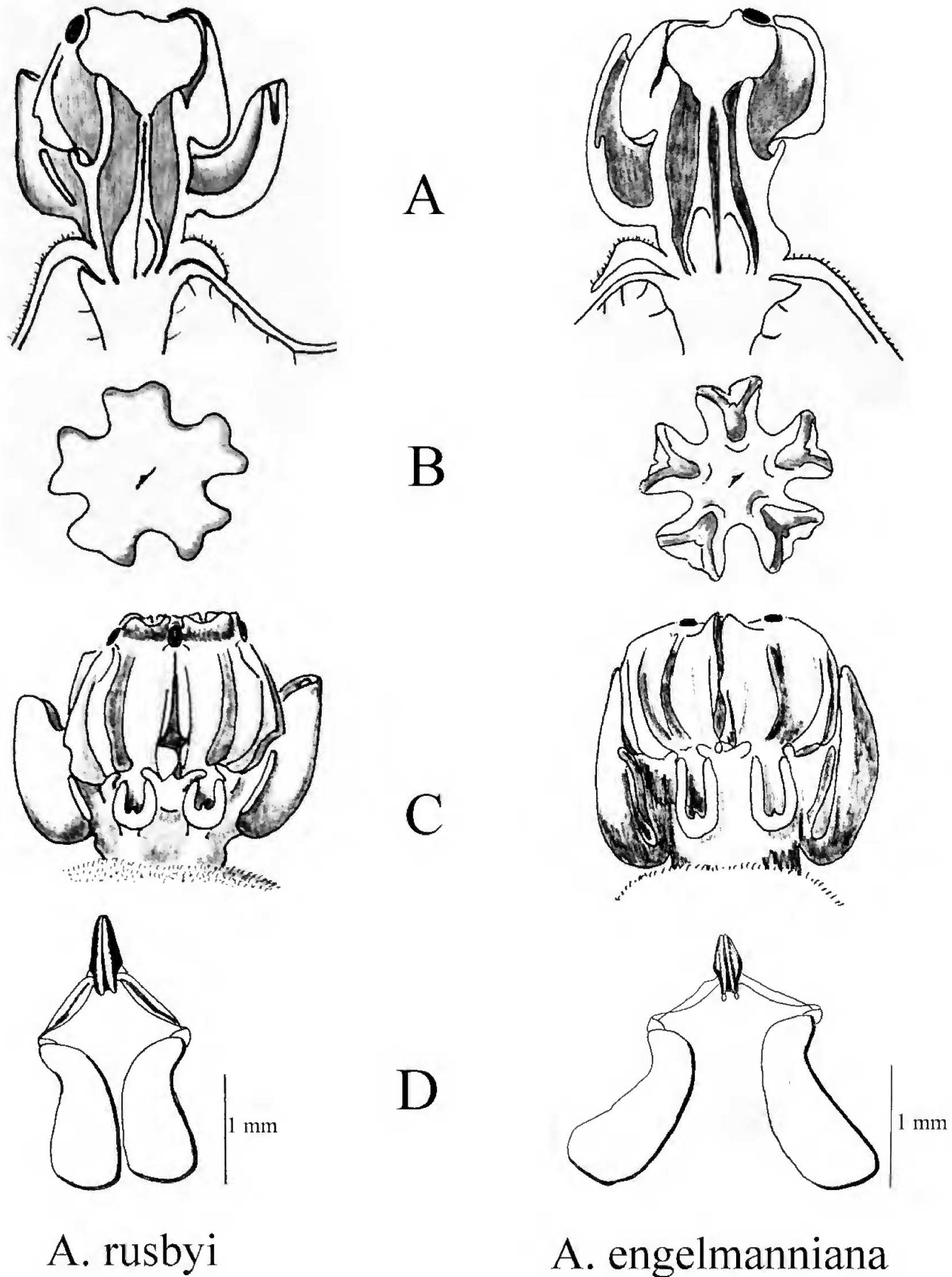


Figure 5. *Asclepias engelmanniana* and *A. rusbyi* compared. A. Radial sections. B. Stigmas seen from above; note the glandular depressions for secretion of the corpuscula and translators in the *A. engelmanniana* stigma. C. Gynostegia with two hoods removed as seen from the side. D. Pollinaria.